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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>7</sup> :</b> <b>C12N 15/10, 9/12 // C12R 1/645</b>	<b>A3</b>	<b>(11) International Publication Number:</b> <b>WO 00/01808</b> <b>(43) International Publication Date:</b> 13 January 2000 (13.01.00)
<b>(21) International Application Number:</b> PCT/US99/15129 <b>(22) International Filing Date:</b> 2 July 1999 (02.07.99) <b>(30) Priority Data:</b> 60/091,668 2 July 1998 (02.07.98) US <b>(71) Applicant (for all designated States except US):</b> RESEARCH AND DEVELOPMENT INSTITUTE, INC. [US/US]; 1711 West College, Bozeman, MT 59715 (US). <b>(72) Inventors; and</b> <b>(75) Inventors/Applicants (for US only):</b> LONG, David, M. [US/US]; 414 S. 8th Street, Livingston, MT 59047 (US). SMIDANSKY, Eric, D. [US/US]; 9630 Cougar Drive, Bozeman, MT 59718 (US). STROBEL, Gary, A. [US/US]; 2107 Fairway Drive, Bozeman, MT 59715 (US). <b>(74) Agent:</b> ADLER, Reid, G.; Morgan, Lewis & Bockius LLP, 1800 M Street, N.W., Washington, DC 20036 (US).		<b>(81) Designated States:</b> AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>  <b>(88) Date of publication of the international search report:</b> 24 February 2000 (24.02.00)
<b>(54) Title:</b> <i>IN VIVO</i> ADDITION OF TELOMERIC REPEATS TO EXOGENOUS DNA GENERATES EXTRACHROMOSOMAL DNAs IN THE FUNGUS <i>PESTALOTIOPSIS</i>		
<b>(57) Abstract</b> <p>This invention relates to compositions and methods useful for producing extrachromosomal DNA. More specifically, the present invention relates to compositions and methods for producing extrachromosomal DNA based on the unexpected discovery that the <i>Pestalotiopsis</i> fungi add one or more telomeric repeats to the ends of exogenous DNA.</p>		

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INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>47714-5001W0</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/US 99/ 15129</b>	International filing date (day/month/year) <b>02/07/1999</b>	(Earliest) Priority Date (day/month/year) <b>02/07/1998</b>
Applicant <b>RESEARCH AND DEVELOPMENT INSTITUTE, INC. et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 5 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☒ furnished subsequently to this Authority in written form.

☒ furnished subsequently to this Authority in computer readable form.

☒ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☒ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☒ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/IS 99/15129

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/10 C12N9/12 //C12R1/645

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JAVERZAT J.-P. ET AL.: "Isolation of telomeric DNA from the filamentous fungus <i>Podospira anserina</i> and construction of a self-replicating linear plasmid showing high transformation frequency" NUCL. ACIDS RES., vol. 21, no. 3, 1993, pages 497-504, XP002124428 the whole document — —/—	18,19

☒ Further documents are listed in the continuation of box C.☐ Patent family members are listed in annex.

## \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

Date of the actual completion of the international search

20 December 1999

Date of mailing of the international search report

11/01/2000

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Authorized officer

Galli, I

## INTERNATIONAL SEARCH REPORT

International Application No

P S 99/15129

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	LONG D.M. ET AL.: "In vivo addition of telomeric repeats to foreign DNA generates extrachromosomal DNAs in the taxol-producing fungus Pestalotiopsis microspora." FUNGAL GENET. BIOL., vol. 24, August 1998 (1998-08), pages 335-344, XP000856850 the whole document	1-19
A	POWELL W.A. & KISTLER H.C.: "In vivo rearrangement of foreign DNA by Fusarium oxysporum produces linear self-replicating plasmids" J. BACTERIOL., vol. 172, no. 6, 1906 - 1990, pages 3163-3171, XP000857613 cited in the application the whole document	1-19
A	GARCIA-PEDRAJAS M.D. & RONCERO M.I.: "A homologous and self-replicating system for efficient transformation of Fusarium oxysporum" CURR. GENET., vol. 29, no. 2, January 1996 (1996-01), pages 191-198, XP000857612 cited in the application the whole document	1-19
A	National Science Foundation (USA), Grant No. 9724999 (Long D.M.) "SGER: Efficient extrachromosomal replication of exogenous DNA by a filamentous fungus" (1997) <a href="http://fundedresearch.cos.com/cgi-bin/NSF/getRec?9724999">http://fundedresearch.cos.com/cgi-bin/NSF/getRec?9724999</a> XP002124429 cited in the application the whole document	1-19

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 99/15129

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:  
See FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

## Continuation of Box I.2

Claims 14,15 and 17 refer to Pestalotiopsis telomerase without giving a technical characterization beyond a statement of the obvious enzymatic activity. Moreover, no such enzyme is defined in the application. In consequence, the scope of said claims is ambiguous and vague, and their subject-matter is not sufficiently disclosed and supported (Art. 5 and 6 PCT). No search can be carried out for such purely speculative claims whose wording is, in fact, a mere recitation of the results to be achieved.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.